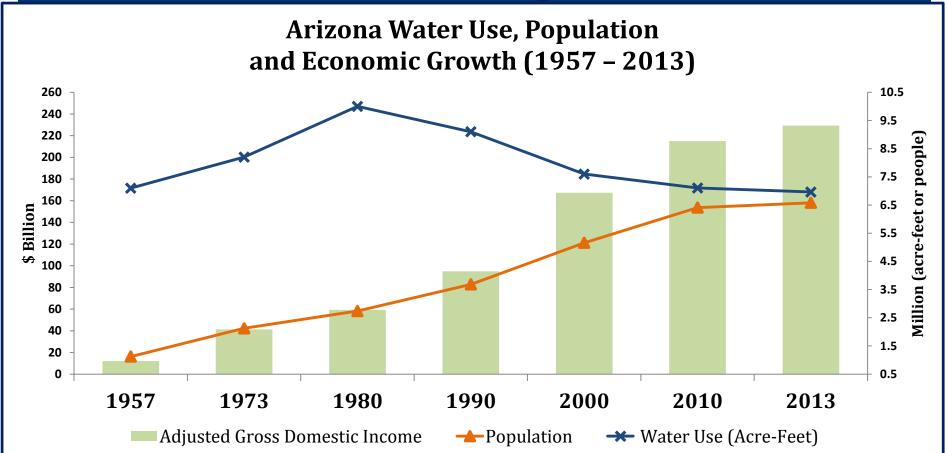
# Colorado River Shortage Preparedness Workshop

## Workshop Overview



Thomas Buschatzke, Director Arizona Department of Water Resources April 22, 2015

#### **Arizona's Water Management Success**

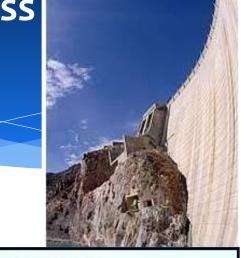


Timeframe	Total Water Use (in million acre-feet)	Population (in millions)	Gross Domestic Income (in billions)	
1957	7.1maf	1.1	\$11.99	
2013	7 maf	6.58	\$229.34	1
Change from 1957-2013	-0.1%	472%	<b>1752%</b> Source: ADWR, 2015	



# Actions that Have Contributed to Arizona's Water Management Success

- Salt River Project
- Colorado River Compact
- Central Arizona Project
- 1980 Groundwater Management Act
- Assured and Adequate Water Supply Program
- Underground Storage and Recovery Program & Arizona Water Banking Authority
  - 8.9 MAF of water stored for future use
- Mandatory Water Conservation Requirements
  - Within the five Active Management Areas
  - <10% water lost or unaccounted for water</p>
  - Best Management Practices
- Drought Preparedness Plan Requirements





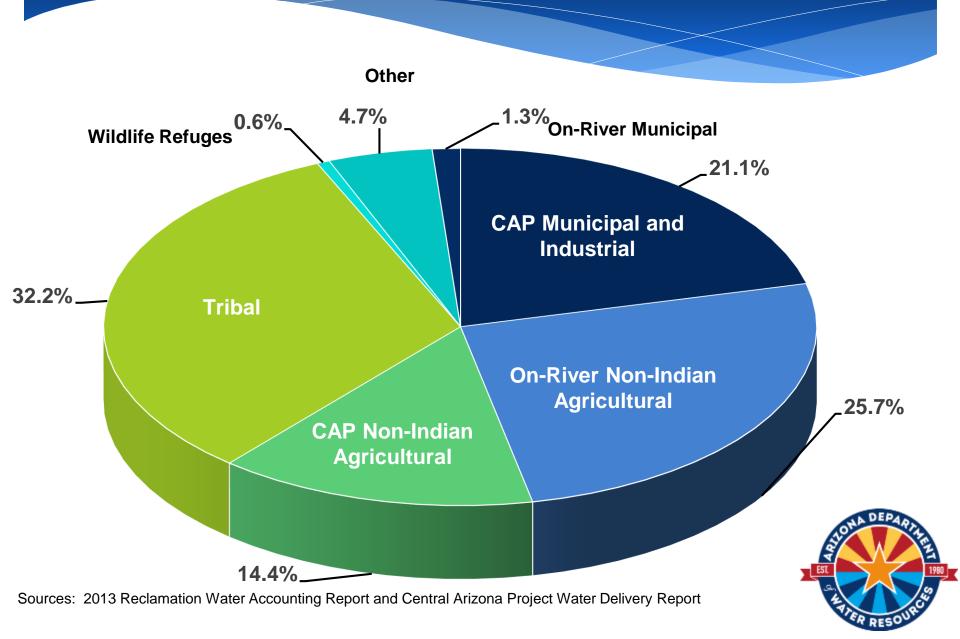


# Arizona's Water Supply Annual Water Budget 2013

Water Source	Million A	cre-Feet (MAF)	% of Total
SURFACE WATER			
Colorado River		2.8	40 %
CAP	1.6		22.5%
On-River	1.2		16.9%
In-State Rivers		1.2	17%
Salt-Verde	.7		
Gila & others	.5		
GROUNDWATER		2.7	40%
RECLAIMED WATER		0.2	3%
Total			7 MAF

Source: ADWR, 2015

#### **Arizona's Colorado River Use**



#### **Colorado River Shortage Preparedness**

- U.S. Bureau of Reclamation predicts that shortage on the Colorado River may occur as early as 2016.
- Some Arizona water users will be impacted by a shortage declaration.
- Cities, Yuma and other on-river Colorado River water users with Priority 4
  entitlements or better will not see a reduction in deliveries during a Tier 1
  shortage.

#### **Main Points:**

- Arizona is NOT in a water crisis.
- The choices that we made decades ago have prepared us for potential shortages on the Colorado River.



## **Probabilities of Lower Basin Shortage**

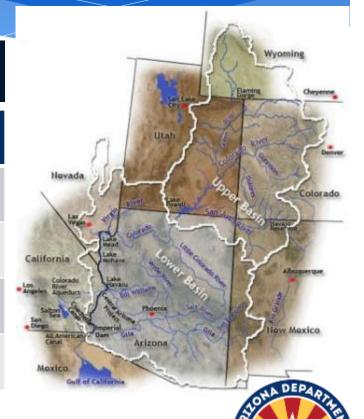
	2015	2016	2017	2018	2019
Probability of any level of shortage (Mead ≤ 1,075 ft.)	0	21	54	62	59
1 <sup>st</sup> level shortage (Mead ≤ 1,075 and ≥1,050 ft)	0	21	45	40	33
2 <sup>nd</sup> level shortage (Mead <1,050 and ≥1,025 ft)	0	0	9	19	19
3 <sup>rd</sup> level shortage (Mead <1,025)	0	0	0	3	7

Source: Bureau of Reclamation January 2015 CRSS modeling.

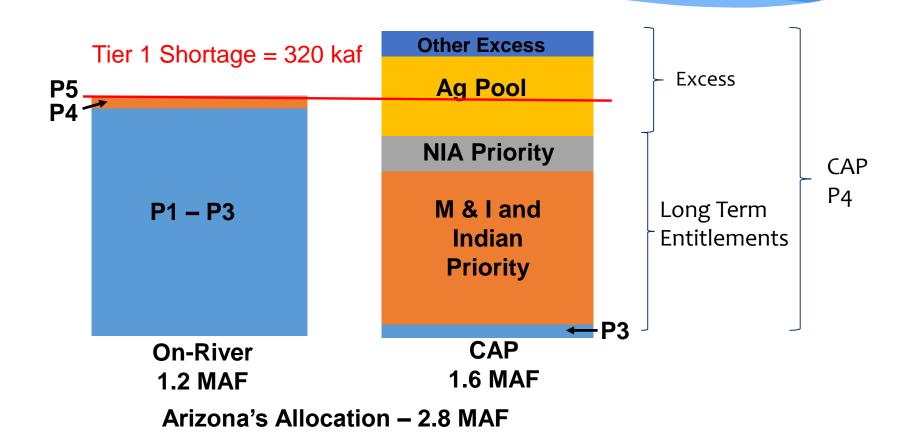
## **Shortage Impacts to Lower Basin**

## Tier 1 Shortage

Lower Basin User	Reduction
Arizona	320,000 Acre-feet
Nevada	13,000 Acre-feet
Mexico	50,000 Acre-feet
California	0



## Arizona Shortage in the Near Term

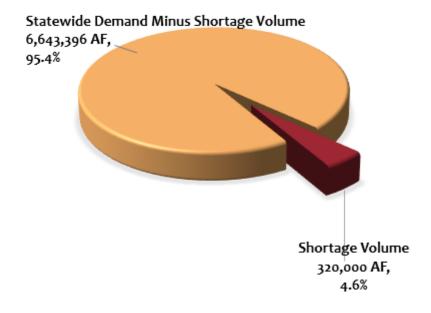


# Near Term Shortage Impact to Arizona Water Users

#### AMA CAP Demand Near-term Shortage Impacts

# AMA CAP Demand Minus Shortage Volume, 1,281,811 AF, 80% Shortage Volume, 320,000 AF, 20%

#### Statewide Demand Near-term Shortage Impact



# RECLAMATION

Managing Water in the West

Management of Colorado River Reservoirs and Current State of the System

Daniel Bunk Hydrologist, Lower Colorado Region

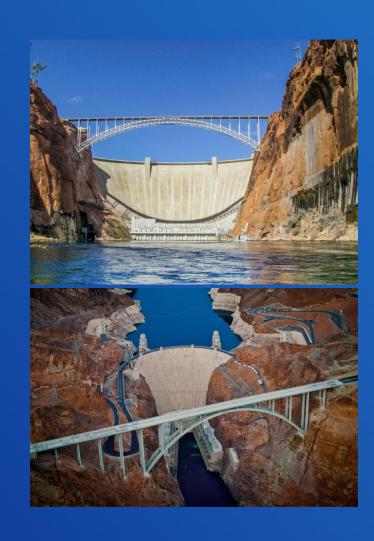
**Colorado River Shortage Preparedness Workshop April 22, 2015** 



U.S. Department of the Interior Bureau of Reclamation

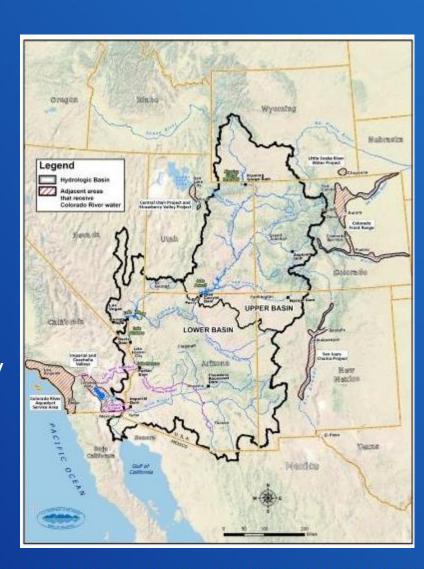
#### **Presentation Overview**

- Overview of the Colorado River Basin
- Current Drought and Reservoir Conditions
- Operational Decision-making and the 2007 Interim Guidelines
- Projected Operations in 2015 and 2016
- Questions / Discussion

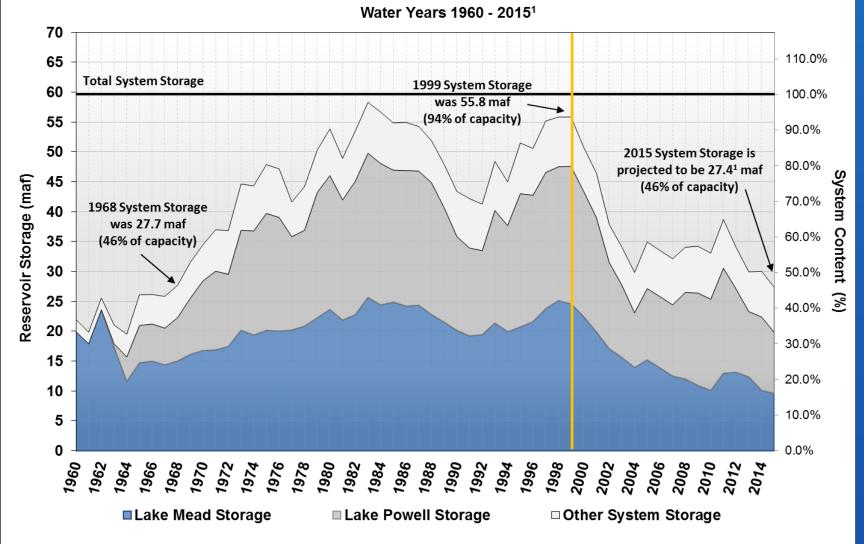


#### Overview of the Colorado River System

- 16.5 maf allocated annually
  - 7.5 maf each to Upper and Lower Basins
  - 1.5 maf to Mexico
- In Upper Basin, water deliveries are managed by state engineers
- In Lower Basin, the Secretary has role of Water Master
  - Water delivered to Mexico is coordinated with IBWC
- About 16 maf of average inflow annually
  - 14.8 maf in the Upper Basin and 1.3 maf in the Lower Basin
- 60 maf of storage
- Operations and water deliveries governed by the "Law of the River"



#### **System Storage - End of Water Year Total Volumes**



<sup>&</sup>lt;sup>1</sup> End of Water Year 2015 storage is based on projections from the April 2015 Most Probable 24-Month Study.

#### Overview of the 2007 Interim Guidelines

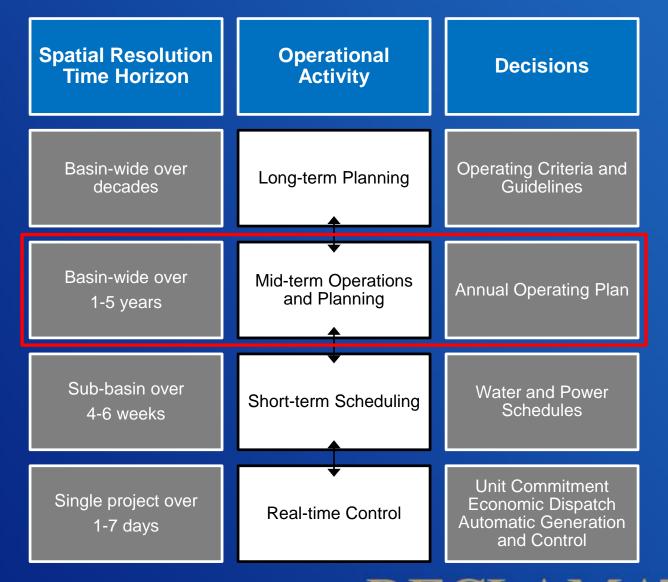




- In place for an interim period through 2026
- Provide for coordinated operations of Lake Powell and Lake Mead under a full range of reservoir conditions
- Encourage efficient use and management of Colorado River water through the ICS mechanism
- Establish guidelines for shortage in the Lower Basin

## RECLAMATION

## **Operational Decision Making Hierarchy**



## RECLAMATION

#### 24-Month Study and the Annual Operating Plan

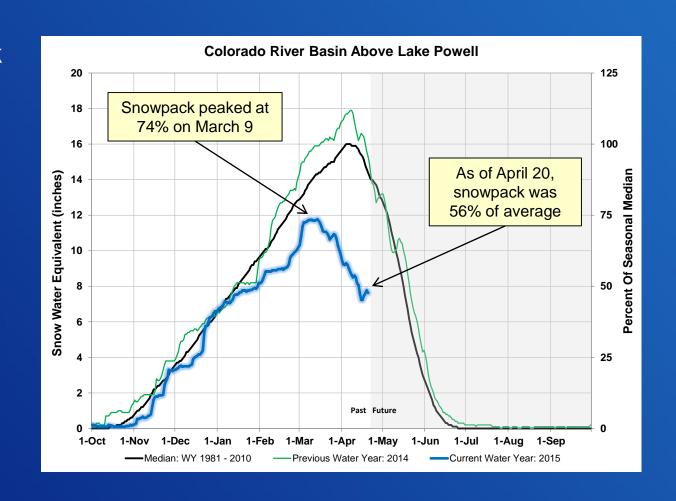
- AOP is a report on the current year's operations and the upcoming year's projected operations
  - http://www.usbr.gov/lc/region/g4000/aop/AOP15.pdf
- AOP determinations use projections from the "24-Month Study" model when setting operating tiers
- Timing of Operational Decisions
  - August 24-Month Study projections of January 1 elevations sets the operating tiers for Lake Powell and Lake Mead
  - When Lake Powell is in Upper Elevation Balancing Tier, <u>April 24-Month Study</u> projections of September 30 elevations may result in an adjustment to Lake Powell's operations

# Upper Basin Snowpack and Forecasted Inflow Water Year 2015

Current Snowpack 56% of median

Forecasted
2015 April-July
Inflow
47% of average

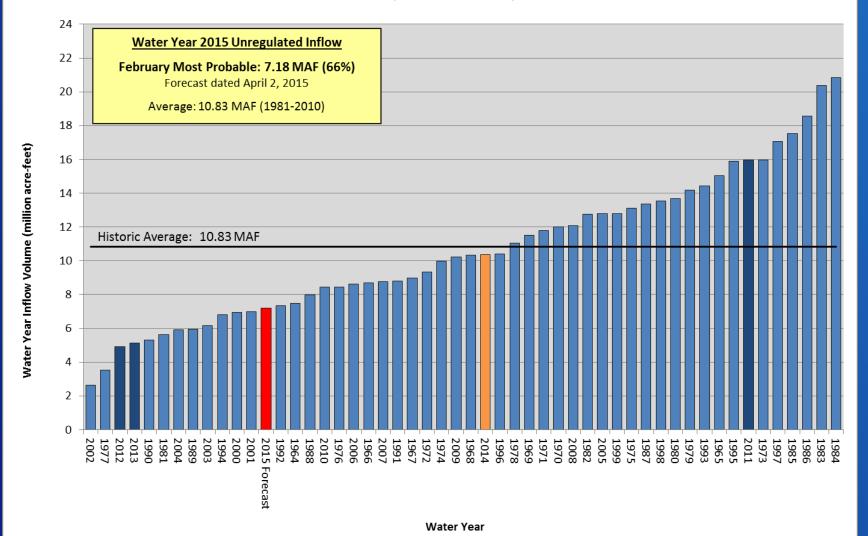
Forecasted
Water Year 2015
Inflow
63% of average



#### **Unregulated Inflow into Lake Powell**

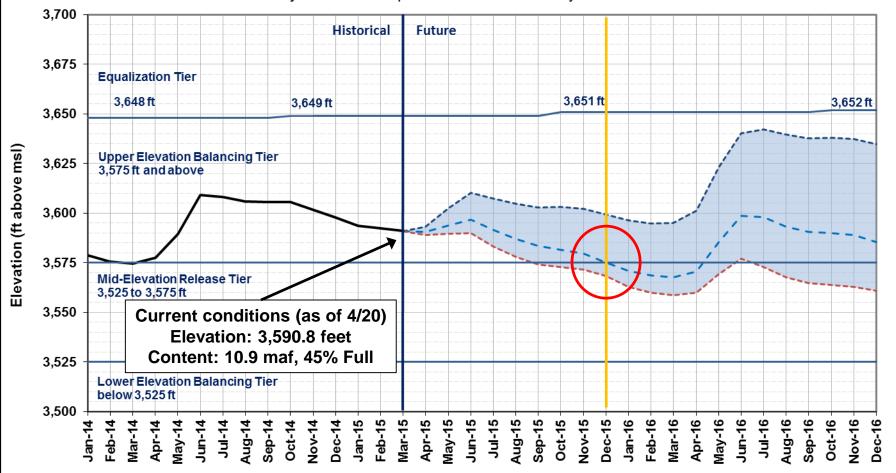
#### Forecasted Water Year 2015 Inflow

Comparison with History



#### Lake Powell End of Month Elevations

Projections from April 2015 24-Month Study Inflow Scenarios

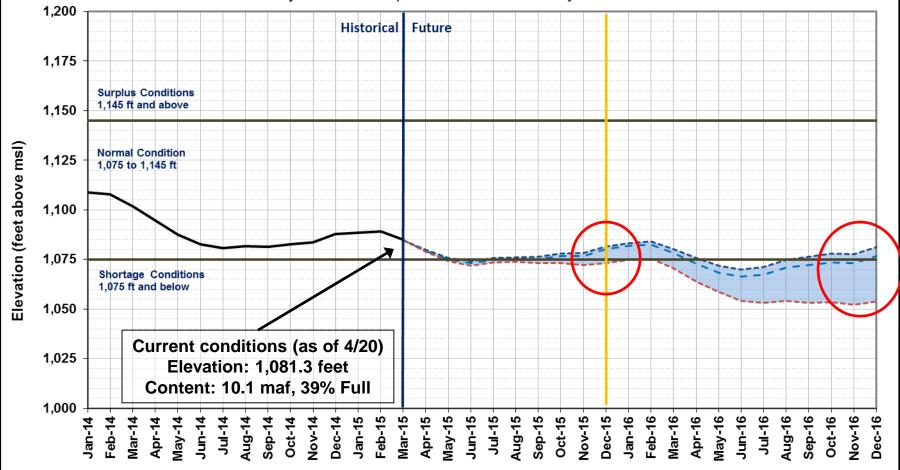


- ----- April 2015 Probable Maximum Inflow with Lake Powell Release of 9.00 maf in WY 2015 and WY 2016
- - April 2015 Most Probable Inflow with Lake Powell Release of 9.00 maf in WY 2015 and WY 2016
- ---- April 2015 Probable Minimum Inflow with Lake Powell Release of 8.93 maf in WY 2015 and 7.48 maf in WY 2016
- Historical Elevations



#### Lake Mead End of Month Elevations

Projections from April 2015 24-Month Study Inflow Scenarios



- ---- April 2015 Probable Maximum Inflow with Lake Powell Release of 9.00 maf in WY 2015 and WY 2016
- - April 2015 Most Probable Inflow with Lake Powell Release of 9.00 maf in WY 2015 and WY 2016
- ---- April 2015 Probable Minimum Inflow with Lake Powell Release of 8.93 maf in WY 2015 and 7.48 maf in WY 2016
- ----- Historical Elevations

#### Summary

- We are currently experiencing an unprecedented drought on the Basin
- The hydrologic uncertainty that still remains this year may impact operations in 2015 and 2016, including the chance of Lower Basin shortage in 2016
- Key parameters impacting shortage will be monitored as actual conditions unfold through the remainder of the year
- Cooperation and collaboration will be the key to finding sustainable solutions and addressing current and future challenges



# RECLAMATION



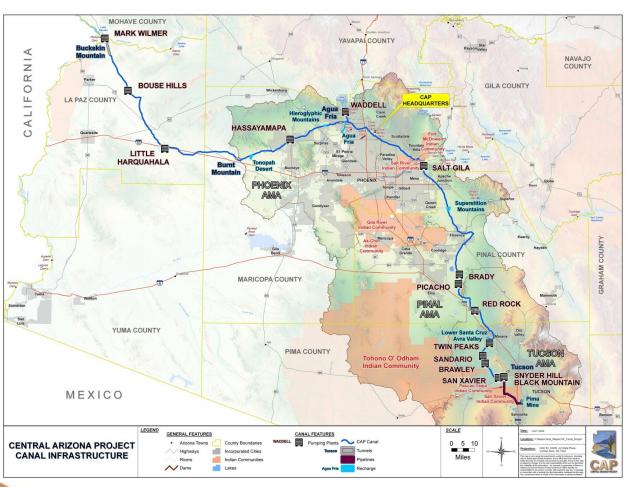


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# Shortage Impacts to Arizona & Near and Longer-Term Risks

Chuck Cullom CAP Colorado River Programs Manager April 22, 2015

#### **Central Arizona Project**



336-mile aqueduct

14 pumping plants lift water nearly 3,000 feet

Delivers ~ 1.6 MAF/yr

Diverse customers: 11 tribes, 11 irrigation districts, ~ 50 cities

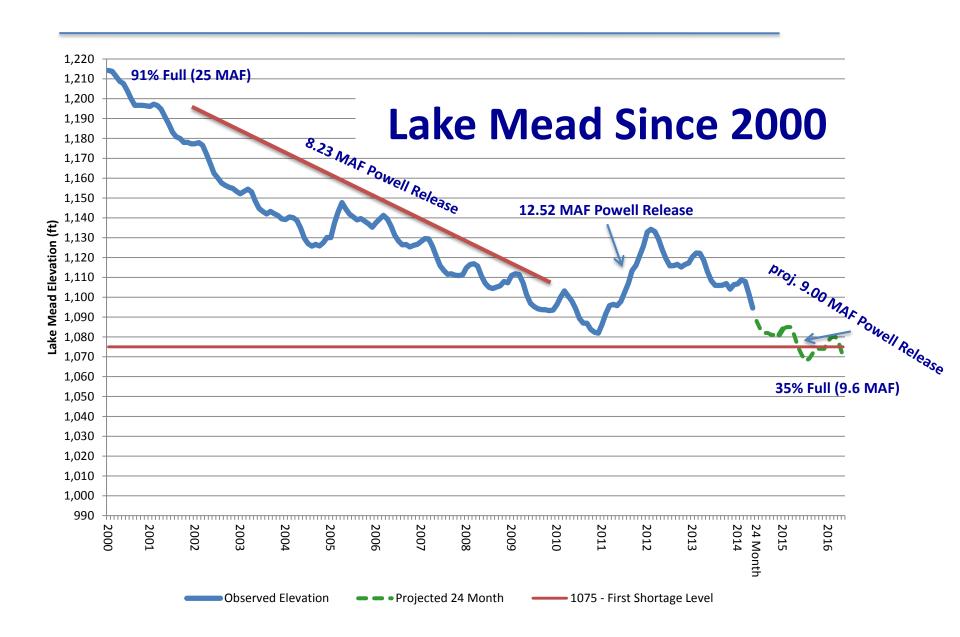
80% AZ pop. reside in CAP Service Area

50% of AZ's economy related to CAP deliveries

Junior Priority, vulnerable to shortages



#### **Looming Shortage**



## Water Budget at Lake Mead

- Inflow = 9.0 maf (release from Powell + side inflows)
- Outflow = -9.6 maf
   (AZ, CA, NV, and Mexico delivery + downstream regulation and gains/losses)
- Mead evaporation losses = 0.6 maf
- Balance = -1.2 maf

Given basic apportionments in the Lower Basin, the allotment to Mexico, and an 8.23 maf release from Lake Powell, Lake Mead storage declines about 12 feet each year

## RECLAMATION

#### Impact of "Structural Deficit"

- Results in a decline of 12+ feet in Lake Mead every year when releases from Powell are "normal" (8.23 MAF)
- Undermines effectiveness of the 2007 Guidelines
- Drives Lower Basin to shortage
- CAP forced to bear obligations of others
  - Evaporation and other system losses
  - Lower Basin's half of Mexican Treaty obligation



#### **2007 Shortage Sharing Guidelines**

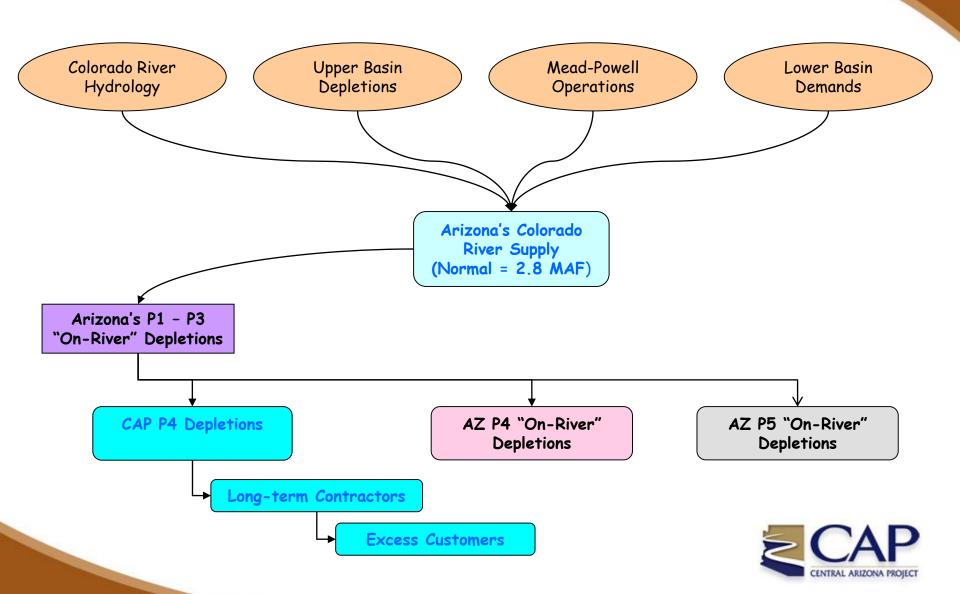
- Arizona and Nevada share Lower Basin shortages under the 2007 Guidelines
- Mexico voluntarily agreed in Minute 319 to accept reductions in its deliveries at the same elevations

Lake Mead Jan 1, Elevation*	Arizona Reduction	Nevada Reduction	Mexico Reduction
1075′	320,000 AF	13,000 AF	50,000 AF
1050′	400,000 AF	17,000 AF	70,000 AF
1025′	480,000 AF	20,000 AF	125,000 AF

No reductions to California under '07 Guidelines



# Lower Colorado River System Summary: Water Supply to Arizona & CAP

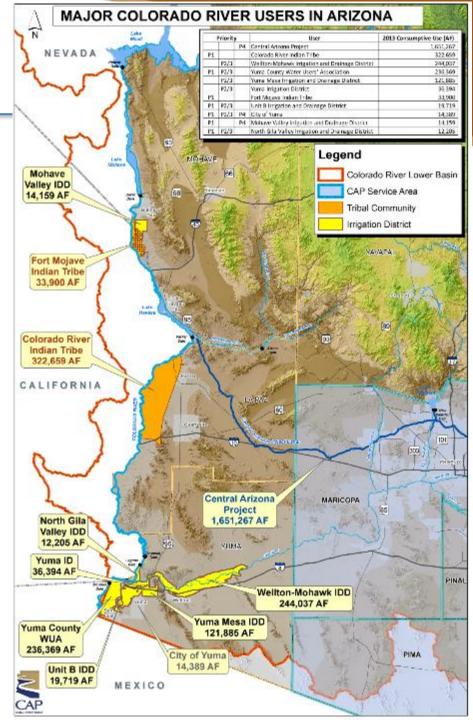


# Arizona Colorado River Users Summary:

- Requires Delivery Contract
  - Sec V. Boulder Canyon Project Act
- Consumptive Use:

Diversions – Return Flows

- Arizona = 2.8 MAF CU
- Arizona Priorities:
  - P1 (e.g. CRIT & YCWUA)
  - P2/P3 (e.g. WMIDD & YMIDD)
  - P4 (e.g. CAP & MVIDD)
  - P5/P6 Excess & Surplus (e.g. CVIDD)
- CAP Unquantified Contract:
  - Access to unused Arizona supply



# Impact of Shortage to Arizona Colorado River Users:

- Tier 1 Shortage = 0.320 MAF Reduction
  - Arizona 2.8 MAF 0.320 = 2.480 MAF CU
- Reduce P5 Diversions to 0
  - Current P5 users: AZ Game & Fish, AZ State Land, Hopi
     Tribe, APS, & CVIDD
  - Total '13 P5 Diversions ~ 5,500 AF
- Implement ADWR Director's P4 Shortage Sharing Recommendation (CAP & "On-River" P4 Users)
  - Shortage reductions fall to CAP





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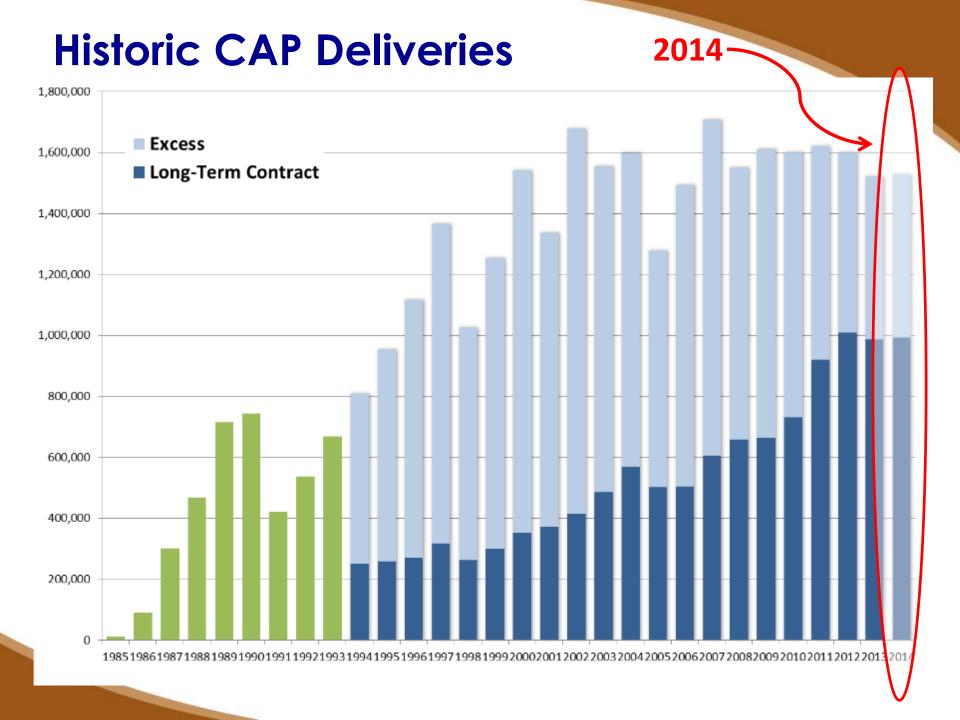
# Shortage Impacts to CAP Priority Pools and Customers

Shortage Workshop April 22, 2015

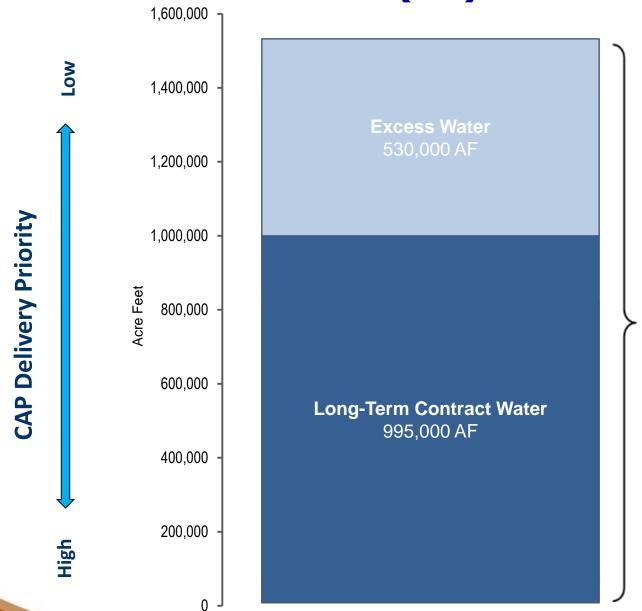
#### **Priorities within CAP**

- Annual CAP water deliveries first meet Long-term Contract demands
- Then Excess demands are met
  - Excess includes the Agricultural Settlement Pool and water for underground storage and replenishment
- As long-term contractors have grown into their entitlements, less Excess water has been available
- In the near-term, Excess water serves as a shortage buffer to longterm contractors





#### 2014 CAP Deliveries (AF)



1,525,000 AF



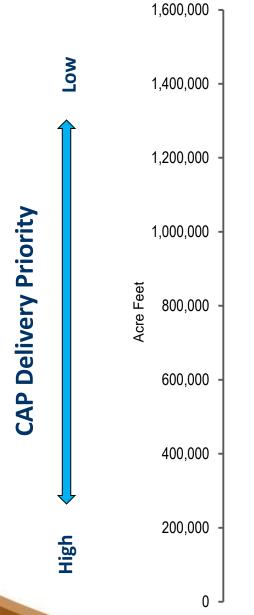
### **Priorities within CAP**

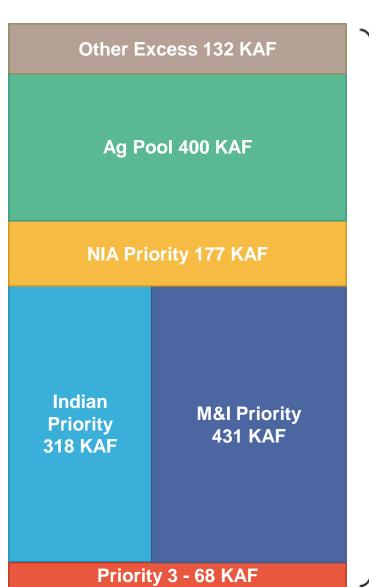
- Long-term Contracts have a priority scheme that insulates cities and tribes from many of the impacts of shortage
- Four long-term contract Priority types:





## 2014 Deliveries by Priority (AF)

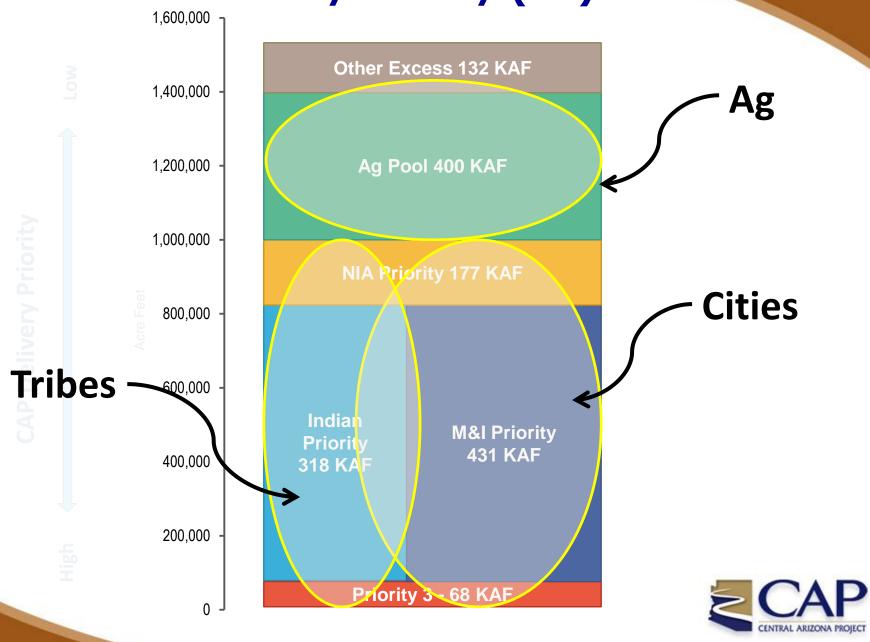




1,525,000 AF



## 2014 Deliveries by Priority (AF)



# Declaration of Colorado River Supply (for next calendar year)

- Reclamation on behalf of the Secretary of Interior
- Colorado River AOP (CRMWG)
- August 24-Month Study
- Final Consultation August

Shortage?
Normal?
Surplus?



August: Declaration of Colorado River Supply for next calendar year

**September: CAP estimates available Colorado River supply** 

- Typically 1.60 1.65 MAF
- Submits estimated diversion schedule to Reclamation



August: Declaration of Colorado River Supply for next calendar year

September: CAP estimates available Colorado River supply

October 1: CAP customers' water orders submitted

- M&I
- Federal/Indian (Oct. 10)
- Ag Settlement Pool



August: Declaration of Colorado River Supply for next calendar year



**September: CAP estimates available Colorado River supply** 



October 1: CAP customers' water orders submitted



**November 1: Access to Excess Supply - Statutory Banking Pool** 

- AWBA
- CAGRD Replenishment Obligation & Reserve
- Reclamation Indian Firming



August: Declaration of Colorado River Supply for next calendar year



**September: CAP estimates available Colorado River supply** 



October 1: CAP customers' water orders submitted



**November 1: A2E supply to Statutory Banking Pool** 



- USF Recharge Capacities
- Canal Capacities
- Lake Pleasant storage & operations
- Maintenance & Engineering Outages
- Finalized Water Delivery Schedules



#### CENTRAL ARIZONA PROJECT QUARTERLY SYSTEM DEMAND FORECAST

(acre-feet) 2015

Revised: 12/4/2014

	JAN	FEB	MAR	1st Qtr	APR	MAY	JUN	2nd Qtr	JUL	AUG	SEP	3rd Qtr	OCT	NOV	DEC	4th Qtr	TOTAL
TOTAL CUSTOMER DELIVERIES	73,917	81,689	131,158	286,764	168,209	196,866	188,266	553,341	184,216	155,852	112,389	452,457	91,974	54,440	61,037	207,451	1,500,013
TOTAL CANAL LOSSES	739	1,283	2,185	4,207	2,959	3,425	3,464	9,848	3,382	2,663	2,559	8,604	2,343	1,892	1,423	5,658	28,317
MWD LAKE STORAGE THRU T/O	0	1,294	2,264	3,558	2,117	4,029	4,340	10,486	3,078	1,088	2,088	6,254	2,852	3,058	941	6,851	27,149
SRP/CAP EXCHANGE WATER	0	0	0	0	0	(8,000)	(7,000)	(15,000)	0	0	0	0	0	0	0	0	(15,000)
WADDELL PUMPING	106,000	10,000	12,000	128,000	2,000	0	0	2,000	0	0	18,000	18,000	20,000	55,000	50,000	125,000	273,000
WADDELL RELEASES	0	0	0	0	0	(15,000)	(105,000)	(120,000)	(107,000)	(73,000)	0	(180,000)	0	0	0	0	(300,000)
COLORADO RIVER DIVERSIONS	180,656	94,266	147,607	422,529	175,285	181,320	84,070	440,675	83,676	86,603	135,036	305,315	117,169	114,390	113,401	344,960	1,513,479

TOTAL SYSTEM DELIVERIES	JAN	FEB	MAR	1st Qtr	APR	MAY	JUN	2nd Qtr	JUL	AUG	SEP	3rd Qtr	OCT	NOV	DEC	4th Qtr	TOTAL
MUNICIPAL & INDUSTRIAL:															-		
Subcontract	37,020	33,938	34,520	105,478	33,604	41,168	55,893	130,665	59,299	51,823	51,158	162,280	44,851	36,296	34,633	115,780	514,203
Non-Subcontract (direct use excess)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAGRD (xs replenishment obligation)	1,578	620	2,228	4,426	2,749	8,674	5,099	16,522	4,793	2,085	3,459	10,337	3,276	239	200	3,715	35,000
Salt River Project XS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Water Use Permits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL M&I	38,598	34,558	36,748	109,904	36,353	49,842	60,992	147,187	64,092	53,908	54,617	172,617	48,127	36,535	34,833	119,495	549,203
AGRICULTURAL:																	
Drought	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AG Pool	8,034	9,025	26,637	43,696	42,628	50,516	46,112	139,256	50,006	45,395	24,469	119,870	10,000	2,520	3,736	16,256	319,078
Surplus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL AG	8,034	9,025	26,637	43,696	42,628	50,516	46,112	139,256	50,006	45,395	24,469	119,870	10,000	2,520	3,736	16,256	319,078
FEDERAL:																	
On Reservation	8,121	10,931	17,055	36,107	23,759	25,365	27,008	76,132	27,901	22,616	14,567	65,084	12,974	3,666	11,845	28,485	205,808
Off Reservation	16,898	25,575	45,068	87,541	61,069	65,443	47,624	174,136	33,684	27,433	14,036	75,153	13,576	9,669	7,123	30,368	367,198
TOTAL FEDERAL	25,019	36,506	62,123	123,648	84,828	90,808	74,632	250,268	61,585	50,049	28,603	140,237	26,550	13,335	18,968	58,853	573,006
RECHARGE1:																	
Direct (excess)	766	0	0	766	0	0	0	0	0	0	0	0	979	0	0	979	1,745
Direct AWBA	1,300	1,300	3,500	6,100	3,500	4,800	1,300	9,600	1,300	1,300	1,750	4,350	4,368	1,950	2,250	8,568	28,618
Interstate Banking (from Direct AWBA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect (excess)	0	0	0	0	0	0	1,000	1,000	5,033	500	0	5,533	0	0	0	0	6,533
Indirect AWBA <sup>2</sup>	200	300	2,150	2,650	900	900	4,230	6,030	2,200	4,700	2,950	9,850	1,950	100	1,250	3,300	21,830
Interstate Banking (from Indirect AWBA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0
TOTAL INDIRECT	200	300	2,150	2,650	900	900	5,230	7,030	7,233	5,200	2,950	15,383	1,950	100	1,250	3,300	28,363
TOTAL RECHARGE	2,266	1,600	5,650	9,516	4,400	5,700	6,530	16,630	8,533	6,500	4,700	19,733	7,297	2,050	3,500	12,847	58,726
TOTAL DELIVERIES	73,917	81,689	131,158	286,764	168,209	196,866	188,266	553,341	184,216	155,852	112,389	452,457	91,974	54,440	61,037	207,451	1,500,013

This classification represents EXCESS water that has been directly or indirectly recharged. AWBA, Federal Indian Firming, CAGRD Replenishment Reserve are included in this category. CAP water recharged under Federal or M&I Subcontract are not included.

<sup>2</sup> The AWBA South Side Replenishment Bank is included in this summation. The bank offsets groundwater pumped by NIA conractors on zones near the Gila Indian Reservation. AWBA is required to replenish up to 15,000 acre-feet

August: Declaration of Colorado River Supply for next calendar year

**September: CAP estimates available Colorado River supply** 

October 1: CAP customers' water orders submitted

**November 1: A2E supply to Statutory Banking Pool** 

**November 15: Final CAP Annual Operating Plan** 

#### **December 15: Schedule NGS energy**

- Estimate Hoover and Waddell energy
- Finalize NGS Energy Reserves Submit to Reclamation and WAPA



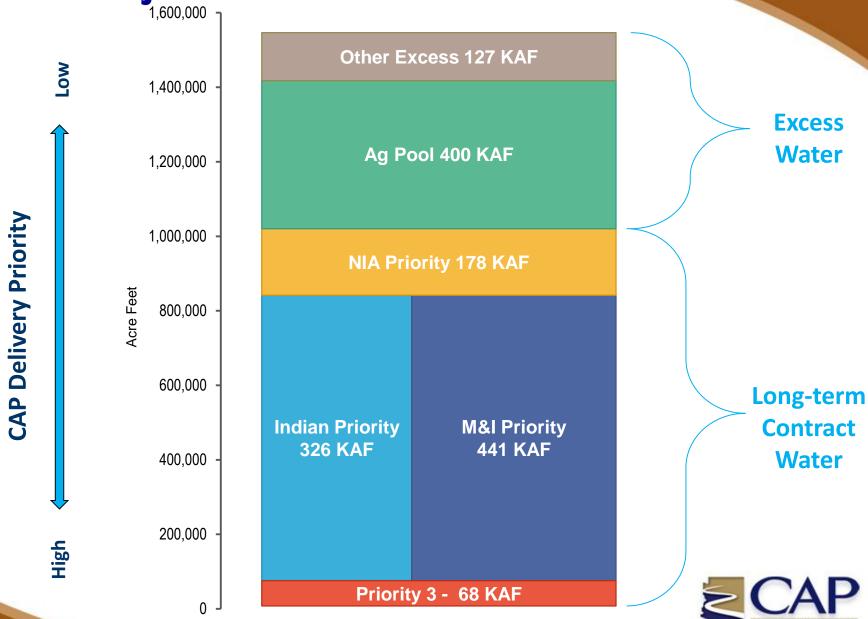
### **Near-Term CAP Projections**

Near-term CAP order projections are developed annually to assist operations and planning.

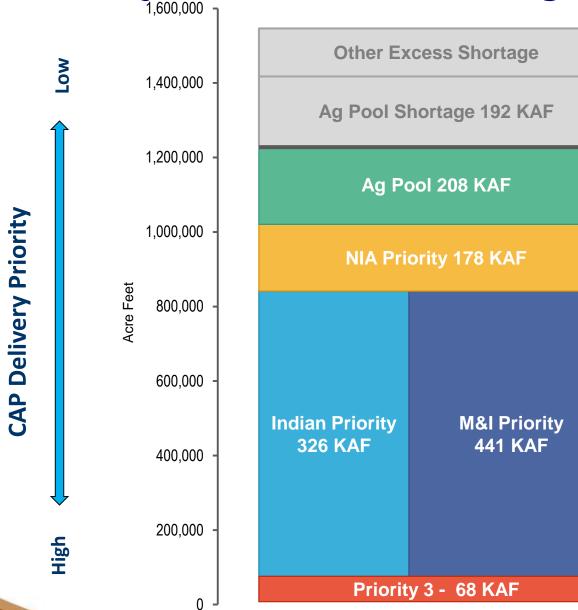
#### Assumptions:

- Normal year delivery volume of 1.54 MAF
  - 2014: 1.525 MAF delivered
  - 2015: 1.578 MAF ordered
- No major changes in customer orders
  - Slight increase in long-term contract orders above 2015
  - Similar rate of Long-Term Storage Credit (LTSC) accrual
- Increased availability of NIA-priority water
  - White Mountain Apache Tribe's allocation finalized by 2016
  - Recent NIA reallocation (46,629 AF) finalized and ordered in 2017

## 2016 Projected CAP Orders



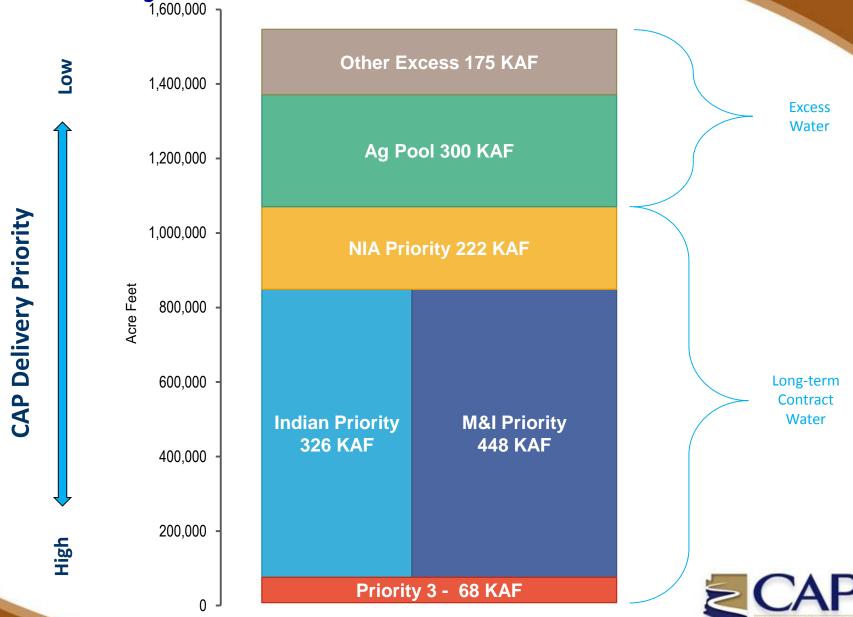
## 2016 Projected Tier 1 Shortage Impact



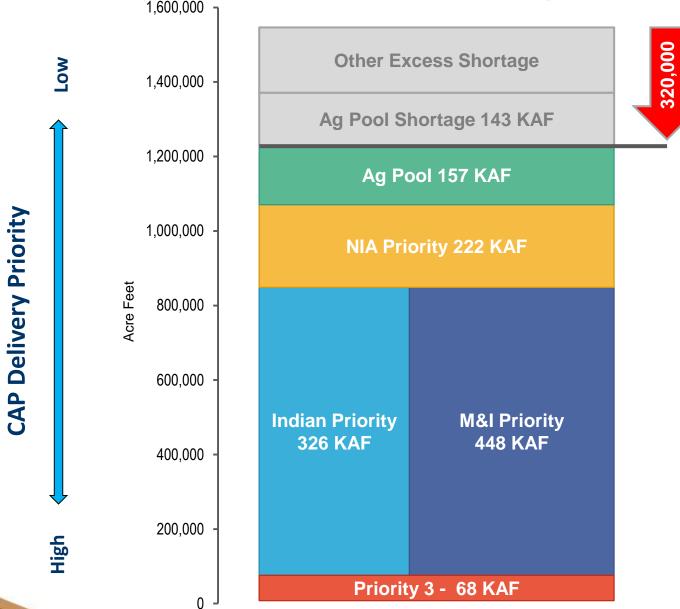


320,000

## 2017 Projected CAP Orders

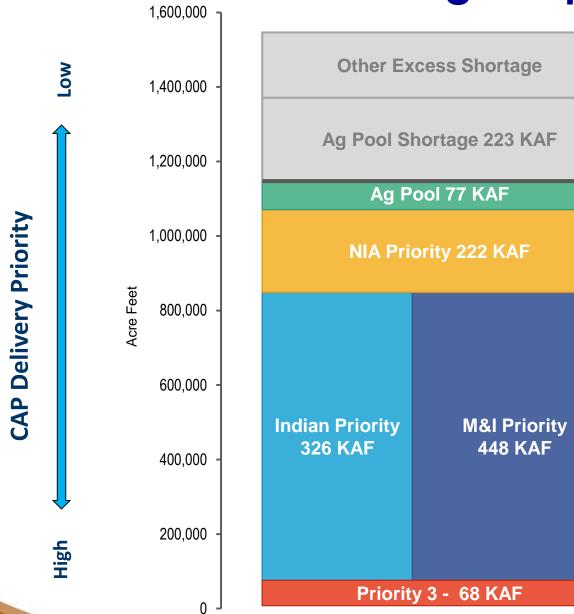


## 2017 Projected Tier 1 Shortage Impact





## Near-term Tier 2 Shortage Impact





400,000

### **Projection Uncertainties**

- There are several CAP supply & demand uncertainties
  - On-river use → total available CAP delivery supply
  - Changes in customer ordering patterns
  - Availability of other supplies
- There are additional uncertainties during shortage
  - Drought-related conservation or behavioral changes affecting long-term contract orders
  - Impact of rate increases





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## Financial Impacts of Shortage

Shortage Workshop April 22, 2015

#### Financial Impacts of Shortage

- Impact on CAP Water Delivery Rates
- Use of CAP General Ad Valorem (10-cent) Property Tax Revenues



- Shortage will impact CAP Water Delivery Rates
  - Primarily impacts Fixed OM&R Rate due to absorption of fixed costs over a lower number of units (AF) delivered
  - Some impact to CAP Energy Rate as well due to fixed costs at Hoover Dam
- Rate = Cost ÷ Volume



#### Tier 1 Shortage

- 320,000 AF ≈ 20% reduction in diversions and deliveries
- 20% reduction in diversions will result in a 25% increase in the Fixed OM&R Rate
  - E.g., 2016 Fixed OM&R Rate would become \$103/ AF versus the published (non-shortage) rate of \$83/AF



#### Tier 2 Shortage

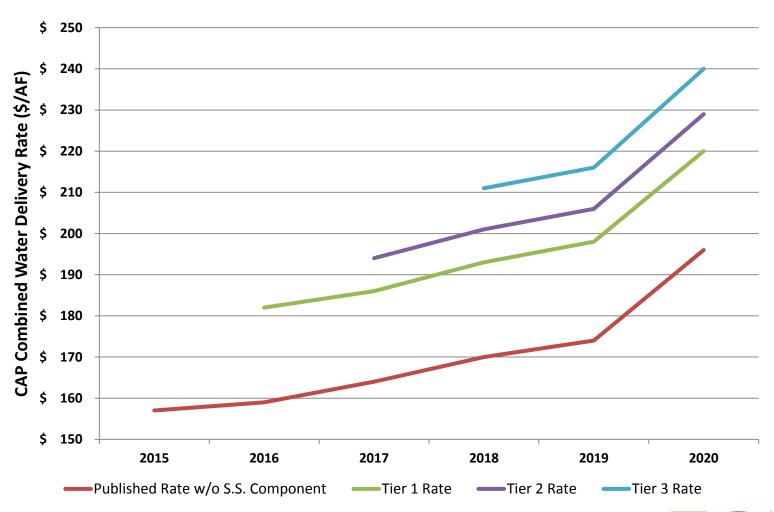
- 400,000 AF ≈ 25% reduction in diversions and deliveries
- 25% reduction in diversions will result in a 33% increase in the Fixed OM&R Rate
  - E.g., 2017 Fixed OM&R Rate would become \$113/ AF versus the published (non-shortage) rate of \$85/AF



#### Tier 3 Shortage

- 480,000 AF ≈ 30% reduction in diversions and deliveries
- 30% reduction in diversions will result in a 43% increase in the Fixed OM&R Rate
  - E.g., 2018 Fixed OM&R Rate would become \$127/ AF versus the published (non-shortage) rate of \$89/AF





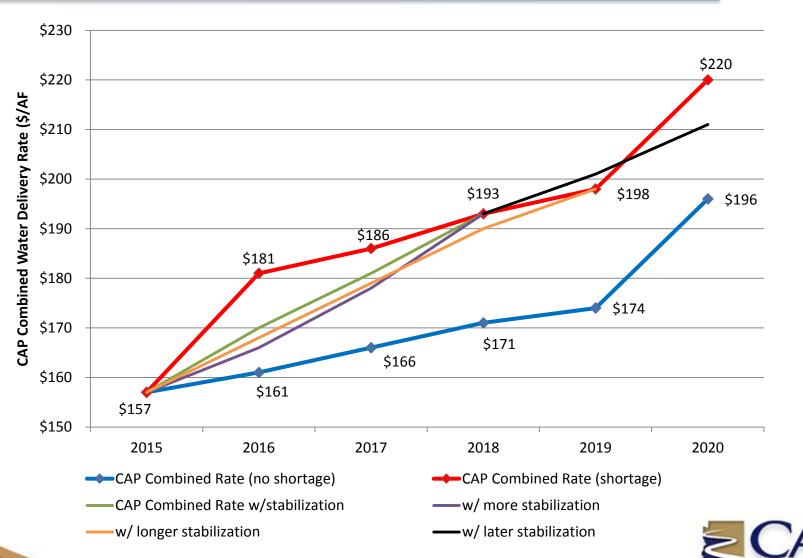


#### **CAP Water Rate Mitigation Measures**

- Shortage Stabilization Fund (\$19-27 million depending on timing of shortage) – includes all CAP ratepayers of Fixed OM&R
- 2014 Supplemental Shortage Stabilization Program (up to \$10 million) – includes customers who opt-in to this program
- Remaining SO2 Credit Reserves (~\$7.5 Million)



### Rate Stabilization Options (2016 Shortage)



#### <u>History</u>

- CAP is authorized to collect a General Ad Valorem property tax up to 10 cents per \$100 of assessed valuation
  - May be used for any authorized purpose except as a pledge towards repayment of revenue bonds
- In 2007, the General Ad Valorem tax rate was reduced from 8 cents to 6 cents
- Since that time, all of the 6 cents collected has been dedicated to the CAP Ag Pool Program
  - In recent years, the cost of the Ag Program has exceeded the 6 cents collected, in which case the difference has come out of CAP General Fund Strategic Reserves

### **History**

- In 2013, the General Ad Valorem tax rate was increased to 10 cents – the additional 4 cents is dedicated to a "Future Extraordinary Cost Reserve" that is separate from the Strategic Reserves
- In 2017, as part of the Arizona Water Settlements, the CAP Ag Pool is scheduled to decline from 400,000 acre-feet per year to 300,000 acre-feet
  - This decline will reduce the cost of the Ag Program to be more in line with the amount collected from 6 cents of the General Ad Valorem property tax levy

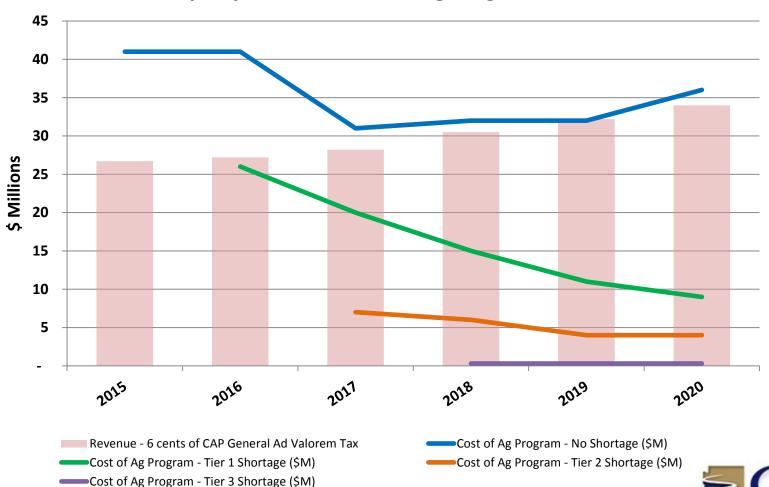


#### **Near-Term Shortage Assumptions**

- Tier 1 Shortage will reduce the Ag Pool to ~200,000 AF or less
- Tier 2 Shortage will reduce the Ag Pool to ~75,000 AF or less
- Tier 3 Shortage will eliminate the Ag Pool
- Since the amount of Ag Pool water delivered will decline during shortage, the amount of General Ad Valorem Property Tax needed to support the costs of the CAP Ag Program will also decline



#### **Property Tax Revenues vs. Ag Program Needs**





### **Impact on CAP Property Taxes**

#### Potential Uses for CAP General Ad Valorem Tax Revenues

- Recovery infrastructure
- Improve Colorado River long-term reliability
- Restore CAP Strategic Reserves to target
- Increase "Future Extraordinary Cost Reserve"
- Provide Water Delivery Rate assistance
- Reduce tax rate
- Other??

### Ultimately a CAP Board decision



# Clarifying Questions?





# Colorado River Shortage Preparedness Workshop

### Arizona's Plans in Action



Thomas Buschatzke, Director Arizona Department of Water Resources Virginia O'Connell, Manager Arizona Water Banking Authority April 22, 2015

### **Arizona's Plans in Action**

- Arizona is prepared to address the challenges of Colorado River shortage
- Arizona Water Banking Authority
- Statewide Drought Plan
- Mandatory municipal provider drought response plans



### **Arizona's Plans in Action**

- Over the last two decades the Arizona Water Banking Authority has stored 3.2 MAF, more than two years' worth of Colorado River deliveries to Central Arizona in order to provide back-up supplies in times of shortage over the long term.
- Arizona water users have also stored water supplies as a component of their water planning efforts.

### **Arizona Water Banking Authority**

- Provides shortage protection for P4 municipal and industrial users of Colorado River water
  - On-River
  - CAP M&I subcontracts
- Assists the State in the settlement of Tribal water rights claims by firming Colorado River supplies
- Assists in fulfilling water management objectives
- Provides a mechanism for interstate water banking



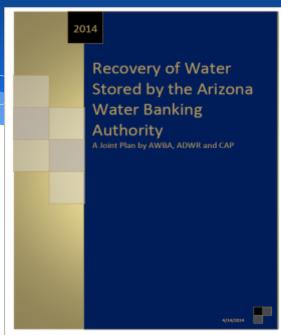
### **Recovery of AWBA Credits**

- A firming requirement is triggered when reductions in Colorado River supplies impact deliveries to CAP and On-River water users for which the AWBA has a firming obligation.
- Based on current demand, it is unlikely that a Tier 1 shortage would require the AWBA to distribute credits
- As demands increase over time that could change



## **Preparing for Recovery of AWBA Credits**





### Preparing for Recovery of AWBA Credits

#### Central Arizona Water Conservation District

- Evaluating the development of recovery infrastructure at key sites
- Developing recovery agreements with partners in each active management area (AMA)
- Objective is to ensure there is sufficient capacity available in each AMA to meet future recovery needs

### Preparing for Recovery of AWBA Credits

#### Arizona Water Banking Authority

- Developing firming arrangements with Gila River Indian Community separate from recovery
- Purchasing credits at optimal locations
- Meeting the AWBA's firming responsibilities will require effective planning and continued coordination among everyone involved



YOUR WATER. YOUR FUTURE.

### **Reservoir Protection Actions**

Chuck Cullom CAP Colorado River Programs Manager April 22, 2015

# Colorado River Shortage Risk: CAP Management Programs

- Storage and Recovery
  - 3.4 MAF of underground storage for future recovery for CAP cities, on-River communities, and tribes
- Lake Mead Reservoir Protection
  - Interstate plan targeting 740 KAF of new storage in Lake Mead
  - CAP's share is 345 KAF by 2017
- Innovative Conservation
  - Interstate funding to conserve 75 KAF to protect Lake Mead/Powell
  - Conservation research grant program
- Augmentation
  - Weather modification projects in the Upper Basin
  - Local and binational desalination



## Arizona Colorado River Reservoir Protection Actions

- Actions to protect Lake Mead elevations to avoid or reduce the risk of shortages,
- Focus on conserving and reducing Colorado River water uses:
  - Arizona
  - Interstate
  - International
- Separate from the significant conservation efforts and programs implemented by CAP customers
  - Municipal
  - Ag
  - Industrial



## Overview of MOU: Lake Mead Reservoir Protection

Parties: CAP, ADWR, BOR, MWD, CRBC, SNWA, & CRCN
Create 740 KAF of additional storage in Lake Mead '14-'17

- CAP = 345 KAF
  - ~145 KAF"system water"
  - ~200 KAFICS
- MWD = 300 KAF
- SNWA = 45 KAF
- BOR = 50 KAF



#### **CAP Reservoir Protection Plan**

- **345 KAF** in '14 '17
  - Intentional creation of system water
    - Total ~ 145 kaf
  - Extraordinary Conservation ICS Program:
     Demand Reduction
    - Up to 100 kaf/yr in '15 and '16
    - Total up to 200 kaf
  - Attempting to achieve 345 kaf by end of 2016
  - Shortage projected in '17 with NO ACTION



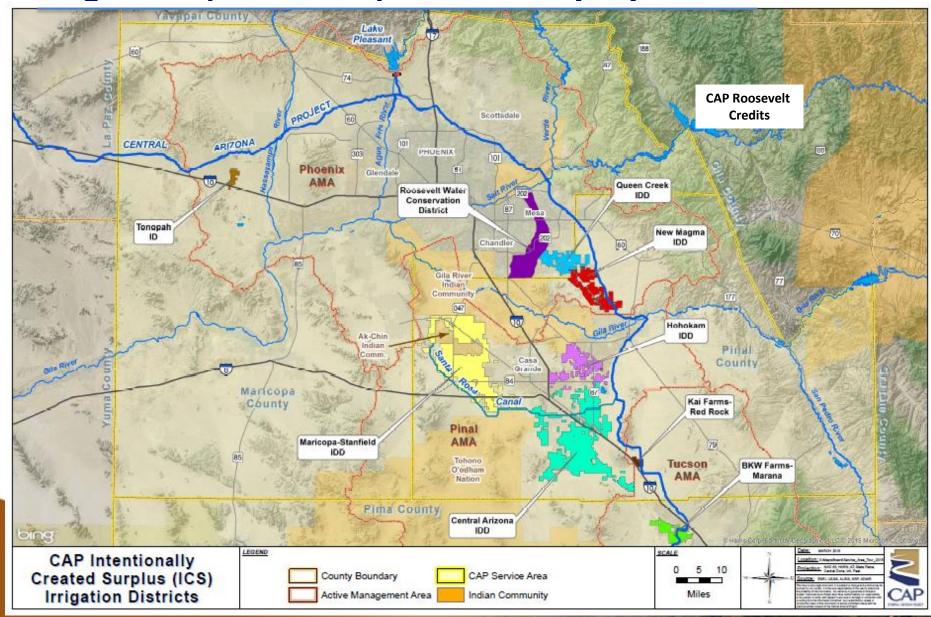
# CAP's Reservoir Protection Volume Plan (values in 1,000 af)



NAME	'14	'15	'16	'17	Total	Note
YMIDD Fallowing	7	7	7	0	21	System water
Ag Pool EC-ICS	0	81	80	0	161	9 CAP Ag Districts
Supply Replacement EC-ICS	0	15	15	0	30	PHX in '15, Others '16
Creation of Az Unused ("2.B. VI")	30	59	44	0	133	Intentional forbearance
TOTAL	37	162	146	0	345	

# Intentionally Created Surplus (ICS): 9 Ag Participants & City of Phoenix ('15)





#### MOU – CAP ICS Administrative Steps

- ADWR Approval completed
- Approval from Nevada Contractors in process
- Approval from California Contractors requested
  - Presented plan in Nov '14
  - California agencies requested delay until April
  - Requesting actions in May June
- Approval from BOR in discussion



### **Pilot System Conservation Agreement**

- Conservation for System Benefit
  - Pooled funding (\$11 M from CAP, MWD, SNWA, DW, BOR)
  - Basin-wide approach
    - Lower Basin
    - Upper Basin
    - Mexico
  - Conservation to protect Lake Powell and Lake Mead



### **Pilot System Conservation Agreement**

#### Lower Basin Status

- BOR Request for pre-proposals in Oct '14
  - 17 responses
  - Concepts submitted in California, Arizona, and Nevada
  - Municipal, industrial, and ag concepts
- Requesting proposals or refinements from 9 respondents
- Goal to contract for projects beginning in May '15



### **Pilot System Conservation Agreement**

### Upper Basin Status

- Funders agreement with Upper Colorado River Commission
- Requesting proposals from Upper Basin entities for conservation projects for Summer '15
- Goal to contract for projects Summer '15
- Monitoring and verification activities
- Assess impacts to Lake Powell & other UB reservoirs



## Colorado River Shortage Preparedness Workshop

## Arizona's Message



Thomas Buschatzke, Director Arizona Department of Water Resources April 22, 2015

## Arizona's Message

- We are NOT in a crisis!
- Arizona's water supplies are resilient because of the choices that we made and actions that we continue to take.
- Some rural areas of the state are facing challenges due to the local impacts of drought.
- Arizona has a recovery plan in place to access stored water when needed.
- ADWR, CAP and other Arizona water managers are closely monitoring the Colorado River and taking proactive steps to address the risk of Colorado River shortages and improve the health of the river system.

## **Up-to-Date Information Sources**

- Central Arizona Water Conservation District Board Meetings
- Arizona Water Banking Authority Commission Meetings
- Groundwater Users Advisory Council Meetings
- ADWR's website: azwater.gov
- CAP's website: cap-az.com

Please send follow up questions to: mamoreno@azwater.gov info@cap-az.com





